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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,138	11/25/2003	Kevin Li	NC34682	9453

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EXAMINER	
ADDY, ANTHONY S	
ART UNIT	**PAPER NUMBER**
2681	

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/723,138	LI, KEVIN	
	Examiner	Art Unit	
	Anthony S. Addy	2681	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 2, 5-11, 13, 14, 16-19, 20-22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshida et al., U.S. Publication Number 20020081987 (hereinafter Yoshida)** and further in view of **Standke et al., U.S. Patent Number 6,694,150 (hereinafter Standke)**.

Regarding claims 1, 2 and 22, Yoshida teaches a system that effectuates receive diversity within a mobile communication device (see paragraph 0023, lines 1-3, paragraph 0025, lines 1-11 and Fig. 1), comprising: a first antenna that facilitates reception of signals in at least one of a PCS band, cellular band, a Korean PCS band, and a China PCS band (see paragraph 0025, lines 1-11, paragraph 0027, lines 1-22 and Fig. 1; where antenna 10 for reception of cellular signals in a cellular phone is shown); and a second antenna that facilitates reception of signals in a GPS band (see paragraph 0028, lines 1-7, paragraph 0043, lines 1-2 and Fig. 1; where antenna 21 for receiving signals in a GPS band is shown).

Yoshida fails to explicitly teach a second antenna that facilitates reception of signals in a GPS band and at least one of the bands received by the first antenna,

wherein tuning of the second antenna depends upon a signal type relayed to the second antenna.

Standke, however teaches a multiple band wireless telephone with multiple antennas, wherein an external antenna is tuned for a multi-band response to access both telephone and GPS signals and a diplexer or electronic switch separates the telephone and GPS signals (see col. 1, lines 38-41). Standke further teaches the external antenna receives telephone signals from a remote telephone base station and also receives GPS signals from a constellation of remote GPS satellites and the signal separator separates the telephone signals and the GPS signals, and applies the telephone signal to the telephone transceiver and the GPS signals to the GPS receiver (see col. 1, line 64 through col. 2, line 3 and Fig. 1; where an external antenna 110 is shown for receiving cellular and GPS band signals).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Yoshida with the system of Standke to include a second antenna that facilitates reception of signals in a GPS band and at least one of the bands received by the first antenna, to allow the mobile communication device to be shared in cellular radio communication and the reception of GPS signals, while maintaining the quality of signal reception in both cellular and GPS modes.

Regarding claim 5, Yoshida in view of Standke teaches all the limitations of claim 1. In addition, Yoshida teaches a system, further comprising: a first tuning component that facilitates tuning the second antenna for reception of signals in a GPS band (see paragraph 0028, lines 1-7 and Fig. 1; where filter 25 and GPS receiver 20 constitutes a

first tuning component that facilitates tuning the second antenna 21 for reception of signals in a GPS band); and a second tuning component that facilitates tuning the second antenna for reception of signals in at least one of the bands received by the first antenna (see paragraph 0025, lines 1-11, paragraph 0027, lines 1-22 and Fig. 1; where multiple-band receiver 11, filters 23 and 24 constitutes a).

Regarding claim 6, Yoshida in view of Standke teaches all the limitations of claim 5. In addition, Yoshida teaches a system, further comprising a RF switch that facilitates coupling the second antenna to one of the first tuning component and the second tuning component (see paragraph 0014, lines 15-22, paragraph 0062, lines 1-6 and Fig. 3; where RF switches 26 and 27 are shown).

Regarding claim 7, Yoshida in view of Standke teaches all the limitations of claim 5. In addition, Yoshida teaches a system, the RF switch being one of a PIN-diode, a MEMS switch, and a FET switch (see paragraph 0014, lines 15-22, paragraph 0062, lines 1-6 and Fig. 3; where RF switches 26 and 27 are shown and it is inherent the RF switches 26 and 27 are one of a PIN-diode, a MEMS switch, and a FET switch).

Regarding claim 8, Yoshida in view of Standke teaches all the limitations of claim 1. In addition, Yoshida teaches a system, further comprising: a first receiving component that facilitates at least one of transduction, modulation, and processing of a signal in at least one of the bands received by the first antenna (see paragraph 0025, lines 1-11 and paragraph 0027, lines 1-22); and a second receiving component that facilitates at least one of transduction, modulation, and processing of a GPS signal (see paragraph 0028, lines 1-7, paragraph 0043, lines 1-7).

Regarding claim 9, Yoshida in view of Standke teaches all the limitations of claim 1. In addition, Yoshida teaches a system, further comprising a RF switch that facilitates coupling the second antenna to one of the first receiving component and the second receiving component (see paragraph 0014, lines 15-22, paragraph 0062, lines 1-6 and Fig. 3; where RF switches 26 and 27 are shown).

Regarding claim 10, Yoshida in view of Standke teaches all the limitations of claim 9. In addition, Yoshida teaches a system, the RF switch being one of a PIN-diode, a MEMS switch, and a FET switch (see paragraph 0014, lines 15-22, paragraph 0062, lines 1-6 and Fig. 3; where RF switches 26 and 27 are shown and it is inherent the RF switches 26 and 27 are one of a PIN-diode, a MEMS switch, and a FET switch).

Regarding claim 11, Yoshida in view of Standke teaches all the limitations of claim 1. In addition, Yoshida teaches a system, further comprising a component that determines frequency of a signal desirably received by the second antenna (see paragraph 0028, lines 1-7 and Fig. 3; where a GPS reception band-pass filter 25 is shown).

Regarding claim 12, Yoshida in view of Standke teaches all the limitations of claim 1. Yoshida further teaches a system, further comprising an emergency component that automatically configures the second antenna to receive a GPS signal upon transmitting data to an emergency number (see paragraph 0007, lines 1-11, paragraph 0028, lines 1-3 and Fig. 1; where a GPS receiver 20).

Regarding claim 13, Yoshida in view of Standke teaches all the limitations of claim 1. Yoshida further teaches a system, comprising: a mobile telephone (see paragraph 0023, lines 1-6 and Figures 1-2).

Regarding claim 16, Yoshida in view of Standke teaches all the limitations of claim 1. In addition, Yoshida teaches a system, further comprising: a first switch that couples one of a first tuning component and a second tuning component to the second antenna, wherein the first tuning component facilitates reception of a GPS signal on the second antenna and the second tuning component facilitates reception of a signal in at least one of the bands received by the first antenna on the second antenna (see paragraph 0062, lines 1-6 and Fig. 3); a second switch that couples one of a first receiving component and a second receiving component to the second antenna, wherein the first receiving component facilitates one of transduction, modulation, and processing of a GPS signal and the second receiving component facilitates one of transduction, modulation, and processing of a signal in at least one of the bands received by the first antenna (see paragraph 0062, lines 1-6 and Fig. 3); and a control component that relays commands to at least one of the first switch and second switch to facilitate a desirable coupling, the coupling based at least in part upon a type of signal desirably received by the second antenna (see paragraph 0063, line 1 through paragraph 0066, line 9 and Fig. 3).

Regarding claims 17 and 20, Yoshida teaches a method for effectuating receive diversity within a mobile communication device (see paragraph 0023, lines 1-3, paragraph 0025, lines 1-11 and Fig. 1), comprising: providing a first antenna that

facilitates reception of a signal in at least one of a PCS band, a cellular band, a Korean PCS band, and a China PCS band (see paragraph 0025, lines 1-11, paragraph 0027, lines 1-22 and Fig. 1; where antenna 10 for reception of cellular signals in a cellular phone is shown); providing a second antenna that facilitates reception of a signal in a GPS band (see paragraph 0028, lines 1-7, paragraph 0043, lines 1-2 and Fig. 1; where antenna 21 for receiving signals in a GPS band is shown); and determining whether a signal in a GPS band is desirably received by the second antenna (see paragraph 0028, lines 1-7, paragraph 0043, lines 1-7 and paragraph 0052, line 1 through paragraph 0056, line 4).

Yoshida fails to explicitly teach tuning the second antenna to facilitate reception of a signal in at least one of the bands received by the first antenna if reception of a signal in a GPS band is not desirable.

Standke, however teaches a multiple band wireless telephone with multiple antennas, wherein an external antenna is tuned for a multi-band response to access both telephone and GPS signals and a diplexer or electronic switch separates the telephone and GPS signals (see col. 1, lines 38-41). Standke further teaches the external antenna receives telephone signals from a remote telephone base station and also receives GPS signals from a constellation of remote GPS satellites and the signal separator separates the telephone signals and the GPS signals, and applies the telephone signal to the telephone transceiver and the GPS signals to the GPS receiver (see col. 1, line 64 through col. 2, line 3 and Fig. 1; where an external antenna 110 is shown for receiving cellular and GPS band signals).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to modify Yoshida with Standke to include tuning the second antenna to facilitate reception of a signal in at least one of the bands received by the first antenna if reception of a signal in a GPS band is not desirable, to allow the mobile communication device to be shared in cellular radio communication and the reception of GPS signals, while maintaining the quality of signal reception in both cellular and GPS modes.

Regarding claims 14, 18 and 19, Yoshida in view of Standke teaches all the limitations of claims 1 and 17. Yoshida in view of Standke fails to explicitly teach a radiating element that is coupled to a transmission line, wherein length of the transmission line is selectable between at least two lengths and altering an electrical length of a resonating element associated with the second antenna to tune the second antenna.

However, the examiner takes Official Notice that it is very well known in the art to alter or vary the length of a transmission line coupled to an antenna element for tuning purposes of the antenna. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to alter or vary the length of a transmission line coupled to an antenna of Yoshida and Standke, to tune the multiple antennas to operate in a desired band.

Regarding claim 21, Yoshida teaches a method for modifying a mobile communication device to enable diversity, comprising: providing a mobile communication device that includes a first antenna tuned to receive a signal in at least one of a PCS band, a cellular band, a Korean PCS band, and a China PCS band, (see

paragraph 0025, lines 1-11, paragraph 0027, lines 1-22 and Fig. 1; where antenna 10 for reception of cellular signals in a cellular phone is shown) and a second antenna tuned to receive a signal in a GPS band (see paragraph 0028, lines 1-7, paragraph 0043, lines 1-2 and Fig. 1; where antenna 21 for receiving signals in a GPS band is shown); coupling the second antenna to a first switch (see paragraph 0062, lines 1-3 and Fig. 3); further coupling the first switch to one of a first tuning circuit that facilitates tuning the second antenna for reception of a signal in a GPS band (see paragraph 0062, lines 1-6 and Fig. 3; where switch 27 is shown coupled to GPS reception band-pass filter 25); coupling the second antenna to a second switch (see paragraph 0062, lines 1-6 and Fig. 3; where antenna 21 is shown coupled to switch 26); and further coupling the second switch to one of a first receiving component that facilitates one of processing, transduction, and modulation of a signal in a GPS band (see paragraph 0062, lines 1-6 and Fig. 3).

Yoshida fails to explicitly teach a second tuning circuit that facilitates tuning the second antenna for reception of a signal in at least one of the bands received by the first antenna.

Standke however teaches a multiple band wireless telephone with multiple antennas, wherein an external antenna is tuned for a multi-band response to access both telephone and GPS signals and a diplexer or electronic switch separates the telephone and GPS signals (see col. 1, lines 38-41). Standke further teaches the external antenna receives telephone signals from a remote telephone base station and also receives GPS signals from a constellation of remote GPS satellites and the signal

separator separates the telephone signals and the GPS signals, and applies the telephone signal to the telephone transceiver and the GPS signals to the GPS receiver (see col. 1, line 64 through col. 2, line 3 and Fig. 1; where an external antenna 110 is shown for receiving cellular and GPS band signals).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to modify Yoshida with Standke to include a second tuning circuit that facilitates tuning the second antenna for reception of a signal in at least one of the bands received by the first antenna, to allow the mobile communication device to be shared in cellular radio communication and the reception of GPS signals, while maintaining the quality of signal reception in both cellular and GPS modes.

Regarding claim 24, Yoshida teaches a system that facilitates receive diversity within a mobile communication device (see paragraph 0023, lines 1-3, paragraph 0025, lines 1-11 and Fig. 1), comprising: a first antenna that facilitates reception of signals in at least two frequency bands (see paragraph 0025, lines 1-11, paragraph 0027, lines 1-22 and Fig. 1; where antenna 10 for reception of cellular signals in a cellular phone is shown); a second antenna that facilitates reception of signals in a GPS band (see paragraph 0028, lines 1-7, paragraph 0043, lines 1-2 and Fig. 1; where antenna 21 for receiving signals in a GPS band is shown).

Yoshida fails to explicitly teach a second antenna that facilitates reception of signals in a GPS band and at least one of the frequency bands received by the first antenna; and a tuning component that dynamically tunes the second antenna to the

frequency currently received by the first antenna for at least one frequency band when reception of a GPS signal is not desirable.

Standke, however teaches a multiple band wireless telephone with multiple antennas, wherein an external antenna is tuned for a multi-band response to access both telephone and GPS signals and a diplexer or electronic switch separates the telephone and GPS signals (see col. 1, lines 38-41). Standke further teaches the external antenna receives telephone signals from a remote telephone base station and also receives GPS signals from a constellation of remote GPS satellites and the signal separator separates the telephone signals and the GPS signals, and applies the telephone signal to the telephone transceiver and the GPS signals to the GPS receiver (see col. 1, line 64 through col. 2, line 3 and Fig. 1; where an external antenna 110 is shown for receiving cellular and GPS band signals).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Yoshida with the system of Standke to include a second antenna that facilitates reception of signals in a GPS band and at least one of the frequency bands received by the first antenna; and a tuning component that dynamically tunes the second antenna to the frequency currently received by the first antenna for at least one frequency band when reception of a GPS signal is not desirable, to allow the mobile communication device to be shared in cellular radio communication and the reception of GPS signals, while maintaining the quality of signal reception in both cellular and GPS modes.

3. Claims 3, 4, 15 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yoshida et al., U.S. Publication Number 20020081987 (hereinafter Yoshida)** and **Standke et al., U.S. Patent Number 6,694,150 (hereinafter Standke)** as applied to claims 1 and 22 above, and further in view of **Eggleston, U. S. Patent Number 6,414, 640 (hereinafter Eggleston).**

Regarding claims 3, 4, 15 and 23, Yoshida in view of Standke teaches all the limitations of claims 1 and 22. Yoshida in view of Standke fails to explicitly teach the second antenna is a top-mounted inverted F-antenna and the inverted F-antenna exhibits circular polarization characteristics.

However, the use of a top-mounted inverted F-antenna exhibiting circular polarization characteristics is very well known in the art as taught for example by Eggleston. Eggleston teaches a top-mounted inverted F-antenna (TOPIFA) used in a mobile station, and wherein the top-mounted inverted F-antenna assembly exhibits circular polarization characteristics (see col. 3, lines 35-47, col. 3, lines 64-67, col. 5, lines 39-52 and Fig. 3). According to Eggleston, the antenna assembly is used in a mobile station operable pursuant to conventional cellular operation as well as to receive GPS signals used for positioning purposes and because of the circular polarization characteristics of the resultant antenna transducer, a relatively high antenna gain characteristic is provided by the antenna transducer (see col. 6, lines 29-41).

It would therefore have been obvious to one of ordinary skill in the art at the time of the invention to implement the antenna assembly of Eggleston in the communication

system of Yoshida and Standke in order to realize a relatively high antenna gain characteristic.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kang et al., U.S. Patent Number 6,662,021 discloses mobile communication system having multi-band antenna.

Hui et al., U.S. Publication Number 2005/0041624 A1 discloses systems and methods that employ a dualband IFA-LOOP CDMA antenna and a GPS antenna with a device for mobile communication.

Kim, U.S. Publication Number 2002/0107033 A1 discloses method ad apparatus for use of GPS and cellular antenna combination.

Forrester, U.S. Patent Number 6,667,723 discloses system and method for a GPS enabled antenna.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony S. Addy whose telephone number is 571-272-7795. The examiner can normally be reached on Mon-Thur 8:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph H. Feild can be reached on 571-272-4090. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Anthony S. Addy
July 25, 2005

ERIKA A. GARY
PRIMARY EXAMINER